Shayan Huda Chowdhury

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EXPERIENCE

Research Assistant, Fifer Lab: New York State Psychiatric Institute, Columbia University Medical Center, New York, NY August 2021 – present
Developing and training self-supervised machine learning models to detect stress patterns in electrocardiogram (ECG) signals for early diagnosis and treatment of stress and anxiety affecting fetal development. Built an algorithm to decompose maternal and fetal ECG signals from abdominal ECG data. Recently started collaborations with researchers at King's College London, University of Washington and Duke University. Wrote a publication to IEEE EMBC 2022 on our findings as the first author.

Executive Director & Co-Founder, Reach4Help March 2020 – present
Leading Reach4Help, a tech nonprofit connecting people in need to trusted volunteer help with 500+ volunteers across 38+ countries. Managing a team of engineers and community leaders to build open-source software for nonprofits like AIESEC in Portugal and the COVID-19 Help Hub in Montréal. Developed a need-matching web platform to coordinate food banks, clothing drives and vaccination support for low-income communities. Developed a global map of 10K+ aid organizations, serving as a single repository of volunteer help through the pandemic, Mexican earthquake, California wildfires, Texas power crisis, Ukrainian invasion, etc.

Lead Data Analyst, a2i Programme, ICT Ministry / Cabinet Division / UNDP Bangladesh March 2020 – November 2021
Member of the National COVID-19 Policy Dashboard Committee of the Ministries of Health and IT. Developed tools for COVID-19 data collection and modeling its spread to inform actionable policy for lockdowns, public health communications and healthcare decisions. Analyzed data on tests, cases, deaths, hospitalizations, and mobility for the Directorate General of Health Services, Institute of Epidemiology, ICDDR,B and with epidemiologists and data scientists from Columbia, MIT, Harvard and UC Berkeley.

Research Intern, Frank Lab: Nobel Laureate Joachim Frank, Columbia University, New York, NY September 2018 – November 2019
Created the highest resolution 3D reconstruction of 40S eukaryotic ribosome subunit to reverse engineer the mechanism of protein synthesis, towards finding cures for cancer and various viruses. Final project was enhancing a suite of bioinformatics machine learning tools to increase accuracy of particle detection and reconstruction in noisy electron microscope images to a resolution of 1.5 Å (0.1 millionth of a millimeter).

Team Leader, Google Mentorship Program, Google, New York, NY October 2018 – June 2019
Led a Stuyvesant HS team working on machine learning to understand and emulate human emotions from voice intonations using RNNs and GANs to develop Digital Personal Assistants for administrative use, medical applications, speech disabilities, among others.

Research Intern, New York Genome Center and Weill Cornell Medical College, New York, NY June 2017 – February 2019
Selected by Stand Up to Cancer Program for internship to study genetic evolution of cancer to determine differences between cancerous and non-cancerous cells. Authored a research paper for Regeneron STS. Contributed analysis to papers submitted to the *Nature* journal.

Intern, Herbert Irving Cancer Center, Columbia University College of Physicians and Surgeons, New York, NY June 2016 – June 2018
As member of cancer demography research team, developed awareness videos on chemoprevention to prevent breast cancer in multi-ethnic women. Supported team with data analysis using relational databases. Trained on legal and confidentiality issues of Human Subjects Research.

PROGRAMMING LANGUAGES: Python, R, JavaScript/TypeScript, MATLAB, Java, C#, C++, Rust, Dart, SQL

RESEARCH PAPERS

- **Chowdhury S.,** Frasch M. G, Wu H., Lucchini M., Shuffrey L. C., Sania A., Malette C., Odendaal H. J., Myers M. M., Fifer W. P, Pini N. (2022). *A Novel Method for the Extraction of Fetal ECG Signals from Wearable Devices*. Preprint for IEEE EMBCC 2022.
- Mahmud, A. S., **Chowdhury, S.**, Sojib, K. H., Chowdhury, A., Quader, M. T., Paul, S., ... & Buckee, C. O. (2021). *Participatory syndromic surveillance as a tool for tracking COVID-19 in Bangladesh*. Epidemics, 35, 100462.
- Chadwick, F., Clark, J., **Chowdhury, S.**, … & Sania, A. (2021). *Combining Rapid Antigen Testing and Syndromic Surveillance Improves Sensitivity and Specificity of COVID-19 Detection: A Community-Based Prospective Diagnostic Study*. Preprint for Lancet Global Health.
- Ferguson E. A., Brum, E., Chowdhury, A., **Chowdhury, S.**, Kundegorski, M., Mahmud, A. S., … & Hampson, K. (2021). *Modelling to inform the COVID-19 response in Bangladesh*. Preprint for Lancet Global Health.
- Brum, E., Saha, S., Sania, …, **Chowdhury, S.**, Haddou, Y., Ferguson, E., Kundegorski, M., Purno, N., Tasneem, M., … Hampson, K. (2021). *Surging COVID-19 in Bangladesh driven by B.1.351 variant*. Preprint for Lancet Global Health.

HONORS AND AWARDS

- Global Shapers, World Economic Forum 2021
- Gates Scholarship Finalist 2019
- AP Scholar with Distinction Awardee 2019
- Bezos Scholars Program Finalist 2018
- MIT INSPIRE: "Differences in Short-term Memory Capacities in Alzheimer's Patients with Different Demographics." Semi-finalist 2018
- New York State Science and Technology Entry Program Conference, Albany, NY 3rd Prize 2015, 2nd Prize 2016, 1st Prize 2017
- National Latin Examination, National Junior Classical League Silver 2016, Gold 2017, Silver 2018, Silver 2019

EDUCATION

Stuyvesant High School, New York, NY Graduation: June 2019
Scholarships: Daniel Bergstein Memorial Scholarship 2019, Elizabeth Piper Scholarship 2018
City University of New York: College Biology, Principles of Microeconomics, Intro to Psychology, Intro to Statistics 2019-2021
Columbia University: Sci of Psychology (INSPN0160-61), Contemporary Civilization (COCI CC1101) (Freedom & Citizenship Prog) 2015-2019
Harvard University Summer School: Foundation of Neuroscience (BIOS-50) 2018

SKILLS AND INTERESTS

- *Clubs and Societies:* President of Research Club, National Latin Honor Society, Stuyvesant Alumni Mentoring Program
- *Languages/Skills:* English & Bangla (fluent), Latin & Spanish (int.), Music Composition, Spartans Wrestling Team, Taekwondo (Red belt)